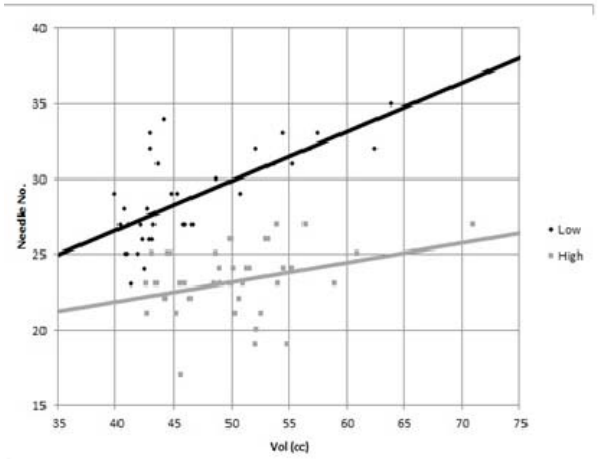
Results: The use of increased activity seeds significantly reduces needle number. This impact can be seen more with larger prostate volumes; with an average reduction of 6 needles per patient. Prostate dose stats shows a slightly higher average dose is achieved to prostate (D_{90} high-149.8Gy (99.4-178.2) against D_{90} low-147.5Gy (100.39-177.28)) as well as rectum (D_{2cc} high-121.8Gy (62.1-189.27) D_{2cc} low-116.3Gy (71.26-181.75) and bladder (D_{2cc} high-84.0Gy (55.4-148.3) D_{2cc} low-84.6Gy (44.29-135.94)), however the increase in dose is unlikely to be clinically significant. The amount of patients that fall outside of the recommended constraints following post implant scan is the same in both high and low activity cases.



Conclusions: Whilst a decrease in seed number is easy to predict when utilising higher activity seeds to achieve the same total activity for an implant, a less obvious relationship exists in needle number reduction. Needle number particularly peri-urethral needles have been shown to be associated with increased urinary-tract toxicity, by conservatively increasing activity of I-125 seeds it could be theorised that there will be a decrease in trauma associated LUTS while maintaining coverage and meeting OAR constraints.

EP-1609

Optimization of SourceLink connectors in LDR-brachytherapy seed implant orders

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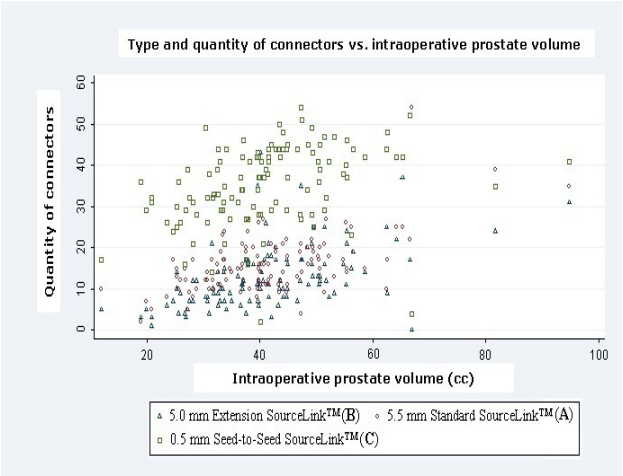
Purpose/Objective: According to preoperative prostate volume, nomograms in low dose rate (LDR) permanent prostate brachytherapy allow to estimate the number and activity of seeds required for an interstitial implant procedure. Our purpose is to study the quantity of needles and connectors employed in manual afterloading stranded seed implants and to find similar relationships with pre-implant prostate size. It would optimize ordering and using of material.

Materials and Methods: We have registered 150 ^{125}I-LDR interstitial prostate implants with Prolink™ service, QuickLink™ delivery system (C. R. Bard, Inc.) and VariSeed™ v.8.0.2 treatment planning system (Varian Medical Systems, Palo Alto, CA, USA). Each of their needle charge scheme has been reviewed for the following counting: number of seeds (**#Seeds**), 5.5 mm standard SourceLink™ connectors (**A**), 5.0 mm extension connectors (**B**), 0.5 mm seed-to-seed connectors (**C**) and quantity of needles used (**N**). Intra- and preoperative prostate volume were also annotated ($\mathbf{V_{intra}}$ and $\mathbf{V_{pre}}$). We have used Stata® v12.0 software for data analysis.
We have carried out a retrospective ordering simulation taking into account available commercial cartridges of connectors in order to test the applicability of the formulae obtained.

Results: Connectors data registered for each implant procedure are plotted in the next figure:



Total connectors sums (A+B+C) are highly correlated with #Seeds (Pearson correlation coefficient r=0.90) and when using SourceLink™ system, because of the needle assembly, every implant obeys the rule:

$$A + C + N = \#Seeds$$

Considering that B *vs.*V_{intra} follows a linear relationship it could then be upper bounded through the 95% confidence level interval superior limits of the regression coefficient and constant:

$$B = 0.36 \cdot V_{intra} + 3.2 \text{ connectors}$$

Other linear regressions also suitable were:

$$A = 0.39 \cdot V_{intra} + 5.3 \text{ connectors } (p=0.00)$$

$$V_{intra} = 1.0 \cdot V_{pre} - 4.6 \text{ cc } (p=0.00)$$

$$N = 0.09 \cdot V_{intra} + 12.6 \text{ needles } (p=0.00)$$

We took a N mean value of 16.5 needles (little variation along prostate volume range). Finally, solving expressions in terms of $\mathbf{V_{pre}}$ and **#Seeds** (can be defined pre-operatively by nomograms):

$$A = 0.39 \cdot V_{pre} + 3.5 \quad \text{connectors}$$

$$B = 0.36 \cdot V_{pre} + 1.5 \quad \text{connectors}$$

$$C = \#Seeds - 0.26 \cdot V_{pre} - 14.8 \quad \text{connectors}$$

Simulation phase: given the statistical nature of these relationships, we reserved one cartridge of each connectors type to assure that we would not run out of them when the surgical procedure took place. A retrospectively application of these formulae yielded that we would had used only those corresponding A, B, C reserved cartridges in 14%, 19% and 12% of the procedures. We would have had only to add that spent cartridge when placing the following order.

Conclusions: When LDR-brachytherapy seeds implant with needle loading on demand technique is used the quantity of the different types of seed connectors can be statistically expressed in terms of the preoperative prostate volume. With enough experience in the implant technique and preoperative prostate volumetric study it is possible to mark out institution-specific bounds to each of these quantities. It optimizes the preoperative prediction of seeds connectors, seeds and needles that will be used and reduces costs in material and storage.

EP-1610

Twelve years treatment results of LDR brachytherapy for prostate cancer in Turkey

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Purpose/Objective: To analyze the twelve years outcomes of I-125 LDR brachytherapy in Turkish men with low-intermediate risk localized prostate cancer.

Materials and Methods: Between 2000-2004, 139 patients treated with LDR brachytherapy were analyzed retrospectively. Brachytherapy was monotherapy in 127 pts.and used with external beam radiotherapy in 12 pts. Four pts excluded from study due to protocol deviation. 135 pts were analyzed for disease control and survival. For all the pts preplanning was done in treatment conditions. During the aplication real time planning was used. Four- six weeks after application postplanning dosimetry was done with CT and MR images. In dosimetry D90, V100, V150, V200, V250 for prostate; V100, V150 for urethra ; V100, dose at 4 cc for rectum were evaluated. Survival curves were calculated using the Kaplan- Meier method, and the significance was calculated by the log-rank test. To compare the prognostic factors Chi- square test was used.

Results: The median follow-up time was 88 months (6-170 months). The median age of 135 pts. Was 65 years (44-81 years). In pts 64.4 % of them were in low risk and 35.6 % in intermediate risk. The mean PSA value at diagnosis was 8,12 ng/ml (SD ±6,33). In 43.2 % of the pts received androgen deprivation for 3 months before procedure . T stages were T1c in 12 pts, T2a in 64 pts, T2b in 53 pts and T3 in 6 pts. During procedure median 28 (18-35) needles and 85 (65-110) seeds at 0.49 U/seed(0.43-0.50) were used. Prescribed dose was set at 145 Gy in monotherapy and 110 Gy in combined treatment. Treatment results were given in table 1.

Table 1: The 5, 10, 12 years outcomes of I-125 LDR brachytherapy in Turkish men with low-intermediate risk localized prostate cancer.

	5 years (%)	10 years (%)	12 years (%)
PSS	100	%100	%100
OS	96.1	90.5	90.5
DFS	99	88.8	81.4
Recurrence	0	4.4 (6pts)	5.9 (8 pts in 14 years)
OS low risk (87pts) intermediate risk (48pts)	95.4 97.4	93.2 87.7	93.2 87.7 p: NS (0.896)
DFS low risk (87pts) intermediate risk (48pts)	98.4 100	86.7 92.2	86.7 73.7 p: NS (0.760)
OS T1-2a (76) T2b (53) T3 (6)	98.4 91.9 100	96.1 79.8 100	96.1 79.8 100 p: 0.133
DFS T1-2a (76) T2bc (53) T3 (6)	100 97.2 100	94.4 81.2 80	94.4 67.6 80 p: NS

PSS: Prostate spesific survival , OS: Overall survival , DFS: Disease free survival, NS: Non significant

Conclusions: Our results are in concordance and comparable with other reports on I-125 LDR prostate brachytherapy.

Electronic Poster: Brachytherapy track: Anorectal

EP-1611

HDR intestinal brachytherapy as a salvage treatment in rectal adenocarcinoma patients

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Purpose/Objective: To analyze efficacy and toxicity profile of intestinal HDR brachytherapy in rectal Adenocarcinoma patients after tumorectomy as a salvage treatment.

Materials and Methods: Between April 2009 and July 2014 15 patients (pts) with adenocarcinoma underwent conformal HDR brachytherapy (HDR-BRT) with a temporary intestinal implants (2-7 catheters). The mean age of pts was 70,47 (range 45-87). Twelve of patients received 30 Gy in 5 days (3 Gy per fraction) twice daily. One patient received 24 Gy in 6 days (4 Gy per fraction). One patient received 10 Gy in single fraction. One patient received 15 Gy in five days (3 Gy per